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Working Paper 578-71
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Senior Lecturer

Address Before the National Industrial
Conference Board, New York, January 21, 1972

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Over the last five years, productivity growth in the American private economy has averaged 2.1 percent per year compared with a 20-year average growth rate of 3.0 percent a year.¹ The slowdown in productivity growth has been sharper and longer lasting than that usually associated with the final stages of a business boom and a recession in business activity. Although most economists agree that a return to a higher level of capacity utilization will produce an improvement in man-hour output, the record of the past five years has led to some speculation that we may be running out of technological steam and that it will be difficult to achieve an accelerated rate of productivity growth in the years ahead.

I do not agree with this diagnosis. I believe that there are vast opportunities for improving labor productivity in the American economy but that these opportunities lie primarily in the inter-firm locus rather than the intra-firm area which until now has been the major sphere for our productivity emphasis. I shall therefore direct my remarks today not to the conventional techniques of simplifying and automating jobs within individual companies -- a process with which you are all familiar -- but

¹Productivity and the Economy, U. S. Department of Labor, Bureau of Labor Statistics, Bulletin 1710, Washington, D.C. 1971, p. 4.

rather to a new conception of applying a systems approach to the flow of product within an entire industry. It is my firm belief that if we really wish to make major breakthroughs in productivity improvement, we must find a way to bring managerial techniques to bear on the vast wasteland of uncoordinated activity which lies outside your corporate door.

Consider for a moment the evolution which has occurred in the application of systems analysis to industrial problems. Systems analysis was first applied to specific problems within a department or with relation to a particular corporate resource or activity. Next it was utilized to control production within a total plant or facility. Today it is increasingly being utilized in connection with the control of total physical distribution within a company's multi-plant operations.

The basic idea which has motivated the gradual extension of the systems approach has been that integrated system performance will produce an end result greater than that from non-coordinated performance. Management has come to recognize that even though individual components of a total system are each working at top efficiency they will not necessarily generate maximum efficiency for the company as a whole. One reason for this result is that the efficiency of individual facilities can often be improved at the expense of the productivity of other units of a company. Take, for example, a company which has a central warehouse and a number of retail stores. Productivity at the warehouse level can be improved at the expense of service to the stores. If the warehouse manager cuts down on the frequency of delivery to the stores, prohibits all special orders, lays out the warehouse on a movement rather than a family commodity basis, and

restricts hours for shipping to suit the convenience of the warehouse he will raise tons shipped per man-hour and may win a bonus. But productivity at the store level will suffer as a result of his action.

It is apparent that there is a trade off between productivity levels in various units of a company and also a trade off between productivity, on the one hand, and sales, profitability, and service, on the other. Achievement of maximum labor productivity within a company consistent with the maintenance of customer service and attainment of profit goals requires an overview of the entire company operation as one system. In recent years numerous companies have recognized the need for such an overview and have given to a corporate officer -- usually the Director of Physical Distribution -- the responsibility of applying systems analysis to the complicated flow of product among the company's varied facilities. Aided by new techniques in simulation, information processing, and management science, many companies have scored spectacular improvements in overall productivity and service by adopting this systems viewpoint toward company operations.

The next logical stage in extension of systems analysis would seem to be the inter-firm relationship within an industry. The problems of making and implementing systems-oriented decisions among separate corporate entities within the confines of our legal structure are fraught with difficulty. But the opportunities for productivity improvement are enormous. While managers have been concentrating on applying the most advanced techniques to improving output per man-hour within facilities subject to their control, they have ignored the effect of their action upon other units

within the industry system. The result is an appalling degree of waste within the system as a whole.

The food industry in this country presents some graphic examples of how fragmented actions in a competitive industry can generate high productivity within individual facilities yet create inefficiency on a broad scale when the industry is viewed as a total system.

The first example involves the problem of pallet size. There are two basic pallet sizes in use in the food industry. The one is the 48' x 40' pallet which manufacturers and chain retailers prefer because it enables them to stock a large quantity of a single product on a single pallet. The other is the smaller 40' x 32' pallet which most wholesalers use because they typically must stock a wide variety of items for their accounts and therefore prefer a smaller pallet which gives them more flexibility with respect to product line. The advantage of shipping via a pallet is that a trailer can be unloaded in about 30 minutes if the merchandise is stored on pallets whereas the same job for a dead load without pallets may take as long as four hours. Yet today it is not uncommon for a manufacturer to ship a pallet load of merchandise on 48' x 40' pallets only to find that the driver must unload the pallets by hand because he has to place the merchandise on the wholesaler's smaller 40' x 32' pallets. The result is four hours of tedious work for a job which would take only 30 minutes if two essential elements of a system flow were available: (1) a uniform size pallet; and (2) a pallet pool for interchangeable pallets used throughout the distribution system. No company executive would permit such waste of manpower to persist within the scope of his own company's opera-

tion, but on an inter-company basis the solutions seem just too remote and complex.

Admittedly the problem is complex. Under current tariff practices, the wholesaler may not view the inefficient use of trucker's time as a cost directly chargeable to him. On the other hand, he is acutely conscious of the costs associated with carrying excess inventory. Nevertheless, if adequate funds were devoted to seeking a solution and if government were to prod industry to seek uniformity, it seems likely that a compromise sized pallet or other materials handling system could be designed which would reasonably satisfy the needs of both wholesaler and manufacturer and at the same time make possible an enormous increase in the productivity of the truck driver. However, as matters stand, the manufacturer clings to the pallet size which maximizes his efficiency and the wholesaler insists on the smaller pallet which better suits his needs, while the system economics remain in a no-man's land of no concern. And strangely enough, both manufacturer and wholesaler will tell you that they are finding it increasingly difficult to find major opportunities for improving productivity within their respective establishments!

Let me cite another example of the conflict between individual company and system productivity. Practically all food manufacturers use automatic palletizers to stack cases of product for shipment to wholesalers and retailers. Such equipment can be used effectively only if the number of different carton sizes to be loaded on a pallet is limited. Each manufacturer imposes such limitations within his plant with respect to his own products and therefore maximizes his efficiency. Unfortunately, however, there is no standardization of carton sizes within the industry as among

different manufacturers. The result is that the wholesaler or retailer warehouse to which product is shipped ends up with as many as 1600 different carton sizes. As a consequence, despite investment in highly sophisticated warehouse equipment, such warehouses cannot use automatic palletizers effectively and usually must load cases on pallets by hand for shipment to stores.

Grocery manufacturers have indicated their willingness to work toward some standard module for carton size if only someone will tell them what that standard should be, but the problem is so complex that no one is spending any time attempting to solve it. Ideally carton sizes in any industry should be based on a modular concept so as to fit together without overhang on a standard pallet and also fit into a truck or railroad car with minimum loss of cube. Such a system could be devised through use of simulation models and advanced techniques of management science. The payoff could be substantial in improvement of labor productivity as well as in more effective use of transport space. But unless government is prepared to spend money for basic research and attempts to provide some basic guidelines, the present haphazard situation will continue. While the examples which I have selected have been taken from the food industry, similar cases of lack of coordination and resulting waste and inefficiency can be found in most major industries.

The problem of carton and pallet standardization is only one part of the broader problem of product proliferation which has become a major source of inefficiency in both manufacturing and distribution in this country. Obviously, major improvements in productivity could be

achieved if through some action we could cut variety within product lines by 25 percent. Unfortunately, no government or industry board has the wisdom required to make such a decision and we as a nation are committed to the proposition that the consumer must be the final arbiter of product variety. However, the same concerns do not necessarily apply to restrictions on size, weight, and dimensions of product. Both businessmen and consumers have already become accustomed to various regulations of this type and the advent of consumerism has broadened the scope of governmental involvement in this area. For example, pursuant to authority granted under the Fair Packaging and Labeling Act, the Secretary of Commerce has convened industry committees which have voluntarily adopted standards with respect to package size in a number of industries.

Standardization is a key element in the search for greater productivity in industry. Standardization makes possible longer runs, thus increasing the productivity of production labor. It reduces inventory and makes for larger lots of fewer items, thus improving the productivity of warehouse labor. In many industries suppliers could build additional components into their products which would save labor in the system as a whole if their manufacturer customers would be willing to agree upon standards so as to permit volume production of the enlarged systems component.

Trade associations have of course had some success in certain industries in achieving some degree of standardization. But their actions have taken years to reach fruition and unfortunately along the way some companies have found Uncle Sam frowning at their efforts, however, commend-

able they may seem from the point of view of maximizing productivity. If we want to accelerate the rate of increase in productivity, government must, on the one hand, prod industry to standardize and, on the other hand, provide a system whereby such agreements can be made and implemented with due regard for the public interest without subjecting individual companies to antitrust prosecution.

The locus of opportunities for major breakthroughs in productivity improvement is changing in this country. We as a nation must be flexible enough in our concept of business and government relationships to exploit this changed situation. Not only are the major inefficiencies in the inter-company orbit, but the nature of technological progress itself may be changing so as to require uniform industry action as a condition of utilization of major innovations. A number of significant technological developments -- some already applied and others on the horizon -- can only be feasible if introduced on an overall industry basis. Examples are the computer-readable check in the banking industry, the elimination of stock certificates in the securities business, and the uniform code and automatic checkout in the food industry. In the latter situation all manufacturers must agree upon a common merchandise code and on the specifications for code application so that the code can be read by sensing devices at store checkouts. This development is particularly interesting to observe because the food industry -- unlike the banking and securities industries -- is unregulated and must find ways of adopting uniform practices affecting manufacturers, wholesalers, retailers, and equipment manufacturers, all without running afoul of the antitrust laws.

Experience so far with the development process for the uniform code has demonstrated the benefit of planning and the need for standardization. In Europe, where there was no centralized planning with respect to merchandise codes as among nations, two separate and distinct codes have developed -- one in Germany and one in France. They are not compatible and the Common Market now has one more complex problem to unravel. The lesson is that technology which runs off in all directions at once may have been satisfactory for a less complex economy, but it will not necessarily meet the needs of the future. I am not suggesting that all technological improvements require standardization or that we should limit the initiative of individual inventors to design new and better systems which may conflict with old established ones. What I am suggesting is that there at least should be some mechanism whereby an industry can discuss, appraise and implement various improvements on a uniform basis without fear of government antitrust action.

Anyone who says that American industry has run out of opportunities to improve productivity has not had the vision to look beyond the confines of the individual plant, warehouse, or store. There are abundant opportunities in this country for major breakthroughs in technology but many are too complex to be accomplished on an individual company basis. Some mechanism must be designed so that all of the companies of an industry can work together to achieve standardization, to improve overall systems performance, and thereby improve productivity for the industry as a whole. Such a mechanism -- perhaps consisting of industry boards meeting under the watchful eye of a representative of the Justice Department -- will have to be designed eventually anyway if Congress acts favorably on the recommenda-

tion of the Secretary of Commerce and decides that the metric system should be adopted in the United States; for adoption of the metric system will require industry-by-industry agreement on new standards.

The movement toward standardization and joint industry action is not without its dangers. But both inflation and wage and price regulation also pose dangers to the future of private enterprise. If we are really committed to improve productivity in this country, the possibility of a broadened systems approach to industry-wide problems deserves the attention of business, labor, and government.

The scope of interest of management in improving labor productivity needs to change. We have farmed our individual plants intensively. But outside the individual company there is abundant acreage where inefficiency flourishes and where managerial techniques can harvest an abundant crop.

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